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## THE PROGRESS OF SCIENCE

### HELMHOLTZ AND VIRCHOW

One hundred years ago were born in Prussia Hermann Helmholtz and Rudolf Virchow, the former in Potsdam on August 31, 1821, the latter in an obscure village of Pomerania on October 13, 1821.

The University of Berlin was opened in 1810 after Prussia had lost by the peace treaty of Tilsit the University of Halle, which Napoleon included in his new kingdom of Westphalia. Germany, defeated in war required to pay an immense indemnity, its army limited to 42,000, turned its energies to education and to science. Both Helmholtz and Virchow were students of medicine in Berlin, and later became professors in the university. Their genius was born with them, but the stimulus and the opportunity to apply it to the advancement of science must in large measure be attributed to the spirit of the university founded by Humboldt and his associates when the political fortunes of Prussia were at low ebb.

Helmholtz was the son of a gymnasium teacher, his mother, Caroline Penne, being a descendant of William Penn. After a childhood of ill health, he studied medicine and was for four years a military surgeon; for a year he was teacher in the Berlin Academy of Fine Arts, and afterwards from 1849 to 1855 professor of physiology at Königsberg. He was professor at Bonn for three years and was then professor of physiology at Heidelberg from 1858 to 1871, when he was transferred to Berlin as professor of physics. In 1888 he was made president of the Reichsanstalt, organized under his direction. All possible academic and national honors were conferred upon him.

A list of von Helmholtz's contri-

butions to science would fill many pages. The essay on the conservation of energy was printed in 1847. Researches of great range and importance, including the invention of the ophthalmoscope, led to his two epoch-making books on physiological psychology—"Tonempfindungen" (1862) and "Physiologische Optik" (1867). Helmholtz always continued his work in physiological psychology, but his transfer from a chair of physiology to one of physics represented a change in his main interests. His great contributions to mathematical physics, especially electrodynamics, are of almost unparalleled importance.

Virchow more than any other one man established the science of pathology and made it possible for medicine to become an applied science. Only second in importance to his contributions to pathology was his work in anthropology which covered all branches of the science. His scientific work was singularly complete. He made numerous and exact observations and experiments; he deduced from them wide-reaching theories; he conducted an important journal for more than fifty years; he wrote text-books, summaries of scientific advances and books popularizing science; he established a school to which students came from all parts of the world, while at the same time taking part in the education of the people; he founded a great museum and took a leading part in scientific societies; he applied science directly to human welfare.

It is almost incredible that among these multifarious scientific activities Virchow should have been one of the leading statesmen of his country. He was a member of the municipal council of Berlin for more than forty



*From a drawing by Lembach (1894)*

**HERMANN VON HELMHOLTZ**



And. Pironi

years, and through him the hygienic conditions of the capital were revolutionized. He was from 1862 a member of the Prussian chamber and was for twenty-five years chairman of the committee on finance. He was leader of the radical party in the Reichstag. In his public career he opposed centralization, autocracy and war, and advocated all measures for the welfare of the people. He was at one time compelled to leave the University of Berlin owing to his political activity, but his personality and eminence were such that he was recalled to a professorship in 1856, and he was thereafter the preeminent representative of academic freedom.

#### THE INTERNATIONAL INSTITUTE OF AGRICULTURE

The president of the International Institute of Agriculture at Rome has transmitted to the Secretary of Agriculture, through the State Department, a copy of resolutions adopted in April, 1921, by the permanent committee of the institute, authorizing the conferring of the title "donating member" upon any person who makes a gift, donation, or contribution to the institute amounting in value to 10,000 Italian lire, which at normal rates of exchange is equivalent to about \$2,000.

The International Institute of Agriculture was established as the direct result of the efforts of David Lubin, a successful merchant of California, with the active support of the King of Italy, who foresaw the advantages which would accrue to agriculture, commerce, and industry from an international clearinghouse for systematically collecting and disseminating official information supplied by the various governments of the world on agricultural production, consumption, movements, surpluses, deficits, and prices of agricultural products, transportation, plant and animal diseases and insect pests, rural credits and insurance, standard of living, wages and hours of labor on farms,

cooperative organizations of farmers, legislation affecting agriculture, and similar information. The international treaty was drafted at Rome on June 7, 1905, and has since been ratified by more than 60 governments.

The institute survived the trying period of the World War and is now entering upon a period of expansion and increased usefulness. Its work benefits all peoples. In accordance with the recent action of the permanent committee, which is made up of delegates from the adhering governments and serves as a board of directors of the International Institute of Agriculture, citizens of the United States and other countries who are in sympathy with the purposes of the institute have an opportunity to contribute to its support and development and to receive permanent recognition therefor as "donating members" by having their names and nationality and the date of their donation inscribed on a marble tablet which will be placed in a conspicuous position in the halls or vestibule of the marble palace occupied by the institute, situated in a beautiful park on an elevation overlooking the Eternal City. Such donations can be made either through the Secretary of Agriculture, the Secretary of State, or the American delegate to the International Institute of Agriculture, Rome, Italy.

#### THE NATIONAL GEOGRAPHIC SOCIETY'S GIFTS OF BIG TREES

The trustees and officers of the National Geographic Society announce to members that the society has been continuing its efforts, begun in 1916, to preserve the Big Trees of Sequoia National Park. By a final purchase in April, 1921, of 640 acres of land in Sequoia National Park, these famous trees, oldest and most massive among all living things, the only ones of their kind in the world, have been saved; they will not be cut down and converted into lumber.